



Curriculum Map for Triple Science Physics Year 10

YEAR 10	Autumn 1	Autumn 2
Topics	<p>Waves</p> <p>Solar System</p>	<p>Particle Model of Matter</p> <p>Atomic Structure - First Half of Topic</p>
Substantive Knowledge – The Knowledge and Content Taught By The Teacher	<ul style="list-style-type: none"> In the Waves topic, students will learn about the key properties of waves and look at how we can use them in everyday life. Students will learn about the Electromagnetic Spectrum, its dangers and uses and in particular light and its behaviour. In the space topic students will learn about the life history of a star, our expanding universe and the proof we have for the beginning and the future of the universe. 	<ul style="list-style-type: none"> In the particle model of matter topic, students will learn about the 3 key states of matter- solid, liquid and gas and how they interact with each other when heated and cooled. Students will learn how we can calculate density for regular and irregular shaped objects. Students will learn about specific latent heat. In the atomic structure topic, students will focus on atoms and radioactivity, the discovery and development of the atom and how it can be changed through radioactive decay.
Disciplinary Knowledge – The Knowledge Scientists Need So They Can Collect, Understand and Evaluate Scientific Evidence	<ul style="list-style-type: none"> History of discovery of waves. EM Specification and how it was discovered. Big bang theory and alternate theories of the formation of the universe. 	<ul style="list-style-type: none"> How the theory of the particle model has changed over time. Boyle’s law and its application. History of the atom and its development over time including the experiments that proved the theories.
Skills	<ul style="list-style-type: none"> Waves practicals develop the skill of working with waves. Understanding how scientific methods and theories develop over time. Using a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts. Appreciating the power and limitations of science and consider any ethical issues which may arise. 	<ul style="list-style-type: none"> Interpreting observations and other data (presented in verbal, diagrammatic, graphical, symbolic or numerical form), including identifying patterns and trends, making inferences and drawing conclusions. Using a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts. Understanding how scientific methods and theories develop over time. Recognising the importance of peer review of results and of communicating results to a range of audiences.

Links To Prior Learning	<ul style="list-style-type: none"> • Waves in Year 8 • Space - Earth Topics covered in Years 7 and 8 	<ul style="list-style-type: none"> • Matter in Years 7 and 8 • Atomic Structure - Looked at Atomic Drawing in Year 8 • Energy in Year 9
Literacy/ Numeracy	<ul style="list-style-type: none"> • Standard form calculations for distance related problems, orbit and waves calculations. • Prefixes in Science. 	<ul style="list-style-type: none"> • Calculations of density, specific heat capacity, specific latent heat and gas pressure. • Rearranging of formula, conversion of units and standard form. • Use of standard form.
Cross Curricular	<ul style="list-style-type: none"> • Waves - Links with Light in Photography, Pitch and Frequency in Music and Projection of Voice in Drama • Philosophy and Ethics - the Big Bang and Evolution • Art - Nebulas 	<ul style="list-style-type: none"> • Food & Nutrition - Changes of State and Temperature • Technology - Hydraulic Presses • History - The Cuban Missile Crisis and the First Nuclear Bombs • Geography - What Happened at Chernobyl and Hiroshima • Philosophy & Ethics - Ethics Amongst Nuclear Power
Assessment	<ul style="list-style-type: none"> • Waves Assessment • Space Assessment 	<ul style="list-style-type: none"> • Particle Model of Matter Assessment • SIR Task for Atomic Structure - as not finished on the topic at this point

YEAR 10	Spring 1	Spring 2
Topics	<p>Atomic Structure - 2nd Half of Topic</p> <p>Electricity - 1st Half of Topic</p>	<p>Electricity - 2nd Half of Topic</p>
Substantive Knowledge – The Knowledge and Content Taught By The Teacher	<ul style="list-style-type: none"> • In the second half of the atomic structure topic, students will learn how radiation can be used in medicine and to generate electricity through fission. • Students will learn about nuclear fusion and its potential for making electricity on earth. • In the electricity topic, students will learn about circuits and how we use them in everyday life. Students will do calculations based around current, voltage, resistance and charge and decide on the best components for the job based around these calculations. • Students will compare series and parallel circuits and the behaviour of current, voltage and resistance in them. 	<ul style="list-style-type: none"> • In the second half of the electricity topic, students will learn about electricity in the home. • Students will learn how to wire plugs correctly and the safety measures in place around the home such as fuses and circuit breakers. • Students will learn about alternating and direct current and where we find them and also identify when an appliance is efficient and how to make it more efficient.
Disciplinary Knowledge – The Knowledge Scientists Need So They Can Collect, Understand	<ul style="list-style-type: none"> • History of nuclear medicine and the safety aspects introduced. • Fusion theory and the concept of using it as a fuel in the future. • History of electricity and the key words associated with it. 	<ul style="list-style-type: none"> • History of electricity and the key words associated with it.

and Evaluate Scientific Evidence		
Skills	<ul style="list-style-type: none"> Using a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts. Using scientific vocabulary, terminology and definitions. Evaluating risks both in practical science and the wider societal context, including perception of risk in relation to data and consequences. Recognising the importance of peer review of results and of communicating results to a range of audiences. Explaining every day and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and argument. 	<ul style="list-style-type: none"> Evaluating risks both in practical science and the wider societal context, including perception of risk in relation to data and consequences Explaining every day and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments. Using a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts.
Links To Prior Learning	<ul style="list-style-type: none"> Atomic Structure - Looked at Atomic Drawing in Year 8 Electromagnets covered in Years 7 and 8 Solar System in Year 10 Autumn Term 	<ul style="list-style-type: none"> Electromagnets covered in Years 7 and 8
Literacy/ Numeracy	<ul style="list-style-type: none"> Standard Form Equation Work and Rearranging Equations Conversion of Units Drawing and Interpreting Graphs 	<ul style="list-style-type: none"> Standard Form Equation Work and Rearranging Equations Conversion of Units Drawing and Interpreting Graphs
Cross Curricular	<ul style="list-style-type: none"> History - The Cuban Missile Crisis and the First Nuclear Bombs Geography - What Happened at Chernobyl and Hiroshima Philosophy & Ethics - Ethics Amongst Nuclear Power Geography - Saving the Planet and Global Warming Technology - Circuits and Labelling PSCHE - Staying Safe 	<ul style="list-style-type: none"> Geography - Saving the Planet and Global Warming Technology - Circuits and Labelling PSCHE - Staying Safe
Assessment	<ul style="list-style-type: none"> Atomic Structure Assessment Electricity SIR Task as only midway through the topic 	<ul style="list-style-type: none"> Electricity Assessment

YEAR 10	Summer 1	Summer 2
Topics	Forces - Part 1	
Substantive Knowledge –	<ul style="list-style-type: none"> Students will learn about the different types of forces and categorise them into vectors (size and direction) and scalars (size only). 	

The Knowledge and Content Taught By The Teacher	<ul style="list-style-type: none"> • Students will learn how forces can impact the movement of objects and how we can calculate and predict movements based off this. • Students will learn how to analyse distance time graphs and velocity time graphs to be able to calculate speed and acceleration. • Students will learn how a skydiver goes through 2 terminal velocities and why. • Students will learn how bungee jumpers need different lengths of rope depending on weight and why this is the case.
Disciplinary Knowledge – The Knowledge Scientists Need So They Can Collect, Understand and Evaluate Scientific Evidence	<ul style="list-style-type: none"> • History and Discovery of Newton’s 3 Laws • Hooke’s Law and its Development • We complete required practical investigations on acceleration and momentum to ensure students are aware of how forces impact on these 2 situations.
Skills	<ul style="list-style-type: none"> • Analysing Motion Graphs • Interpreting Force Diagrams • Using a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts.
Links To Prior Learning	<ul style="list-style-type: none"> • Forces in Year 7
Literacy/ Numeracy	<ul style="list-style-type: none"> • Calculations and Graph Work Throughout • Tangents and Gradients • Rearranging Equations • Stopping Distances
Cross Curricular	<ul style="list-style-type: none"> • PSCH - Link with Reaction Times and Dangers of Drink Driving
Assessment	<ul style="list-style-type: none"> • Assessment on Forces - if completed, if not will be done in September of Year 11